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WINTER/SPRING 2012

# the **in**Field

THE FIELD MUSEUM MEMBER MAGAZINE



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**ON THE COVER**

*Come see the new exhibition, Genghis Khan, and learn about this charismatic leader's vast empire, military feats, cultural influences, and lasting legacy.*

DAVID QUEDRAU / THE FIELD MUSEUM

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The Field Museum salutes the people of Chicago for their long-standing support of the Museum through the Chicago Park District. Programming is partially supported by the Illinois Arts Council, a state agency.

# dear member

It's hard to believe that we're already in a new year! That means more exciting new exhibitions at the Museum. Please be sure to save the date for our annual Members' Nights on April 12 and 13. (See back cover for more.)

Also on the horizon are many exciting new exhibitions. *Genghis Khan*, an in-depth look at the 13th century ruler of the vast Mongol empire, opens on February 24. With beautifully recreated scenes, engaging videos, and the largest collection of Mongolian artifacts ever assembled outside Asia, this exhibition will engage you in the story of a legendary warrior. Read more on pages 4 and 5.

In addition to *Genghis Khan*, the Museum is mounting many other special exhibitions this year. We spoke with Gretchen Baker, Exhibitions Planning and Operations Director, to learn all about them. See page 3 for the exciting details.

One of the biggest draws to The Field Museum is *Inside Ancient Egypt*. Adults and children alike love to explore the mastaba, view our many mummies, and learn what life was like for everyday ancient Egyptians. For the Egyptophiles among us, we have two interesting articles in this issue that you will love. On pages 14 and 15, learn how scanning and imaging technology helped researchers reveal secrets about the Museum's mummies.

As always, we thank you for your continued support and hope to see you soon.



DIANE ALEXANDER WHITE

**MICHELLE CLAYTON**  
Director of Membership

# Opening at the Field Museum in 2012

## A preview of upcoming exhibitions

### **BLOOD/STONES: BURMESE RUBIES**

*January 13 through May 13, 2012*

Among the most lucrative of Myanmar's natural resources are its legendary gemstones. This temporary exhibition provides a glimpse into the world of ruby extraction and examines how such a beautiful and coveted product comes at a great human cost. On display are photographs by Christian Holst who has traveled extensively in Myanmar capturing images of the gem trade.

### **OPENING THE VAULTS: MUMMIES**

*February 17 through April 22, 2012*

Field Museum researchers recently established new information about the Museum's mummy collection using

CT scanning technology. This non-invasive process provided a wealth of data on individual mummies including age, sex, and apparent diseases. See some of the real artifacts alongside spectacular CT imagery for a view inside the sarcophagus. (See pages 14 and 15 for more.)



CAREN BEAN

### **GENGHIS KHAN**

*February 24 through September 3, 2012*

Discover the history, technological innovation, and culture of one of the world's greatest conquerors. View more than 200 artifacts from the reign of Genghis Khan including gold jewelry, weaponry, silk robes, and religious relics. (See pages 4 and 5 for the complete story.)

© OK PHOTOGRAPHY (ABOVE, LEFT)

### **SCIENCE ON THE HALF SHELL**

*March 23 through August 19, 2012*

Did you know that there are over 20,000 different species of clams, scallops, oysters, and mussels living today? Discover the world of bivalves through touchable models, real specimens, and hands-on activities. (See page 16.)

### **NATURE'S TOOLBOX:**

#### **BIODIVERSITY, ART, AND INVENTION**

*May 7 through December 4, 2012*

Biodiversity is fundamental for human existence—it provides us with food, medicine, oxygen, and energy. This exhibition features contemporary works of art that interpret how biodiversity contributes to the quality of our lives. Displayed alongside the artwork will be content reflecting the biological and evolutionary systems that inspired the featured artists.

### **EXTREME MAMMALS**

*May 25, 2012 through January 6, 2013*

Explore the surprising and often extraordinary world of extinct and living mammals. Featuring spectacular fossils and vivid reconstructions, the show examines the ancestry and evolution of numerous species, ranging from huge to tiny, from speedy to sloth-like. Come see the biggest, smallest, most amazing mammals of all time.



© AMNH / D. FINNIN

### **MAHARAJA: THE SPLENDOR OF INDIA'S ROYAL COURTS**

*October 17, 2012 through February 3, 2013*

The word maharaja or "great king" conjures up a vision of splendor and magnificence. This temporary exhibition re-examines the world of the maharajas and their extraordinarily rich culture. On display will be over 250 magnificent objects, many on loan from India's royal collections for the first time. 11F



DAVID QUEENAU / FIELD MUSEUM

# Genghis Khan Invades the Museum!

By Nancy O'Shea, Public Relations Director

**AN UNRIVALED CONQUEROR WHO CHANGED THE COURSE OF WORLD CULTURE IS THE SUBJECT OF A NEW EXHIBITION AT THE FIELD MUSEUM.**

Genghis Khan (opening February 24) showcases the largest single collection of 13th century Mongolian artifacts ever assembled and takes visitors on an unforgettable journey into Khan's legendary empire. The exhibition features more than 200 stunning objects including gold jewelry, weaponry, silk robes, religious relics, and the newly-discovered mummy and tomb treasures

of a Mongolian noblewoman—all capturing the essence of Genghis Khan's empire, his military prowess, cultural influence, and lasting legacy.



© OK PHOTOGRAPHY



*A traditional Mongolian nomad dwelling—called a ger—made of a wood frame and covered in heavy felt.*

Through compelling artifacts, engaging videos, and immersive installations, the exhibition tells the story of Genghis Khan's life: an epic tale filled with brutality, cunning, and intrigue. Born in 1162, and called Temüjin, he endured early hardships including his father's untimely death, his own imprisonment and torture at the hands of a warring tribe, the kidnapping of his young wife, and a deadly rivalry with a sworn blood brother. In 1206, he successfully united the many Mongol clans and earned the title of Genghis Khan, meaning "Oceanic Ruler." He established a code of law and a written language that brought order to the Mongolian steppes and prepared the tribes he united to wage war with civilizations beyond Mongolian borders.



Genghis Khan's place in history is fraught with paradox. His warriors reduced cities to ash, eliminated entire populations, and incited fear throughout medieval Europe and Asia. Yet, he was an innovative leader who brought stability and unity to a vast and varied empire, encouraged education and a meritocracy, and opened trade between Europe and Asia.

Visitors to the exhibition can explore how nomads lived on the grasslands of 13th century Central Asia and learn about Genghis Khan's early influences. They can view a life-size ger (traditional Mongolian dwelling), learn about the role of a shaman, and view elaborate robes and ritual objects used by spiritual leaders.

The rapid expansion of the Mongol Empire was due to the military genius and charisma of its leader. An animated floor map illustrates the vast reach of the empire, which at its peak, stretched from the Pacific Ocean to the gates of Vienna. Murals and video projections place visitors in battlefields to experience the sight and sound of warriors on galloping horses. Visitors will find magnificent weapons, equestrian objects, leather armor and chain mail, and other battle gear including a full-scale replica of a traction trebuchet (used for throwing large stones) and a giant siege crossbow.

*Above: Reconstruction of Kublai Khan's summer retreat at Shangdu, also known as Xanadu (left); and examples of armor and weapons used by Genghis Khan's Mongolian warriors (right).*



## GENGHIS KHAN'S LEGACY

Genghis Khan's empire changed the world. The great conqueror is credited with creating a passport and postal system, establishing diplomatic immunity, and wilderness preservation parks.

He died in 1227 but is still revered as the founding spirit of the Mongolian nation.

Genghis Khan's burial place is one of the greatest archeological mysteries of our time. One imaginative account states that 800 horsemen trampled repeatedly over the burial site to obscure its location. Other soldiers then killed the horsemen so they could not disclose the grave site.

Genghis Khan's third son and successor, Ögödei, established the city of Karakorum, on the Mongolian steppes, as the empire's cosmopolitan capital. Visitors get a glimpse of life in this city through a recreated setting and collection of new archaeological discoveries including jewelry, ceramics, coins, seals, instruments, and textiles.

In the final section of the exhibition, visitors can trace the events that led to the fall of the Mongol Empire and learn about Kublai Khan, the most famous of Genghis Khan's grandsons, whose own life as a warrior and statesman laid the foundation of modern China. **ITF**

*Genghis Khan is produced by Imagine Exhibitions Inc.*

*Lead Sponsor: Allstate*

# Extracting Benefits from Venomous Fish

By Leo Smith, Assistant Curator of Zoology and Head of Fishes

**THERE ARE MORE SPECIES OF VENOMOUS FISHES (OVER 3,000) THAN VENOMOUS SNAKES AND SCORPIONS COMBINED. THE STUDY OF VENOMOUS FISHES PROMISES TO YIELD NEW SOURCES OF PHARMACEUTICALS.**

Most people conjure up snakes or scorpions when they think of venomous creatures, but my recent work has demonstrated that there are at least 15 times as many species of venomous fishes than previously estimated.

Venomous fishes are captivating. They range from the Red Lionfish (*Pterois volitans*) and Reef Stonefish (*Synanceia verrucosa*) to the Poison Fang Blenny (*Meiacanthus grammistes*) and the Palette Surgeonfish (*Paracanthurus hepatus*), made famous by Ellen DeGeneres as Dory in *Finding Nemo*.

Venomous fishes can provoke fear, but their toxins may contain pharmaceutical benefits for humans.

Using the predictive evolutionary framework that resulted from my studies, I'm now beginning to explore fish genomes to identify and characterize the genes associated with the fish venom system. The Museum is hopeful that this exploratory research will discover numerous biochemical leads resulting in new pharmaceuticals. Identifying and characterizing venom and venom-related compounds has been successful in every other venomous group that has been studied. These compounds have led to scores of drugs in various levels of FDA approval or commercial production.



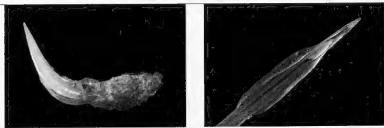
Palette Surgeonfish  
(*Paracanthurus hepatus*)

Even though our knowledge of venomous fishes is in its infancy, it is clear that fish venoms represent a possible new source of pharmaceuticals because of their incredible diversity and moderate levels of toxicity. My collaborators and I have demonstrated that venom has evolved more than ten separate times in fishes. This suggests that each evolution of venom in fishes contains unique properties. And each provides an independent starting point from the venoms of snakes and scorpions which have only evolved one time in each lineage. This diversity presents researchers with a wealth of possible pharmaceutical or cosmetic sources that may be highly effective in humans. **117**

*This research has been supported by The National Science Foundation, The Grainger Foundation, The Negaanee Foundation, and several generous donors through The Field Museum's Women's Board.*



Red Lionfish  
(*Pterois volitans*)



Nature's defense system:

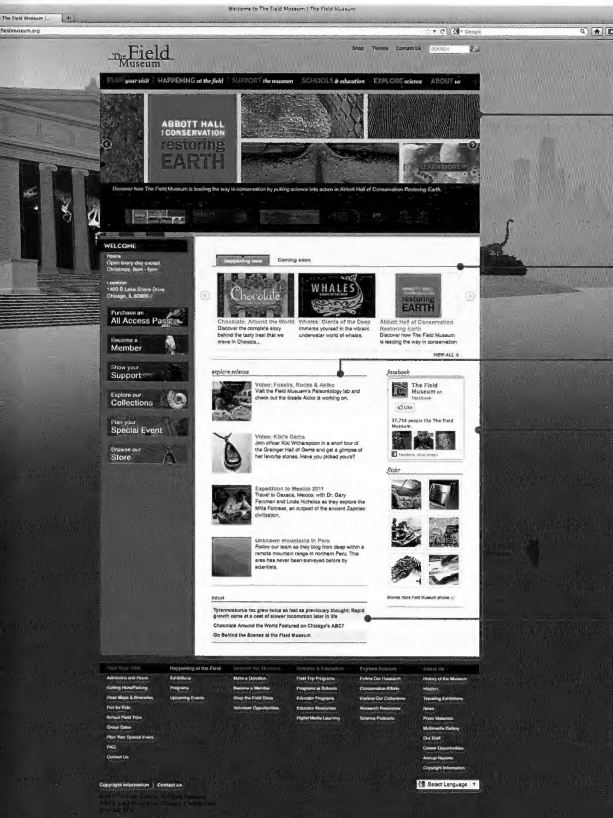
On the left, a tooth from the Poison Fang Benny (*Meiacanthus grammistes*)  
On the right, a spine from the Reef Stonefish (*Synanceia verrucosa*)

ALL IMAGES: © 2006 W. LEO SMITH

# Navigating The Field Museum's New Website

By Jessica Abra Sandy, Web and Digital Media Projects Manager

**THE FIELD MUSEUM IS PROUD TO ANNOUNCE** the relaunch of fieldmuseum.org, the first complete redesign of our web presence since its initial unveiling. The relaunch allows our scientists and professional staff to directly engage with the public. Below is a quick look at some of the new features.



## Rotating Banner

The main banner on the Museum's new home page now features a rotating selection of exhibitions, research projects, and events.

## Exhibitions

See which exciting new exhibitions are "Happening Now" and "Coming Soon."

## Scientist Blogs

Sign-up for Museum scientists' blogs and get updates on fascinating research and fieldwork.

## Social Media

Like us on Facebook. Follow us on Twitter. Share photos of your favorite Museum exhibitions on Flickr.

## News

Catch up with the latest news stories and television spots covering newsworthy events at the Museum.

## Multimedia

Only a click away from the Museum's home page is an array of multimedia content including videos, photo galleries, and podcasts.

Keep checking **fieldmuseum.org** as we unveil more new and intriguing Field Museum stories and features on the site. ITF



# Peggy Macnamara: Museum Artist-in-Residence

By Franck Mercurio, Associate Editor, In The Field

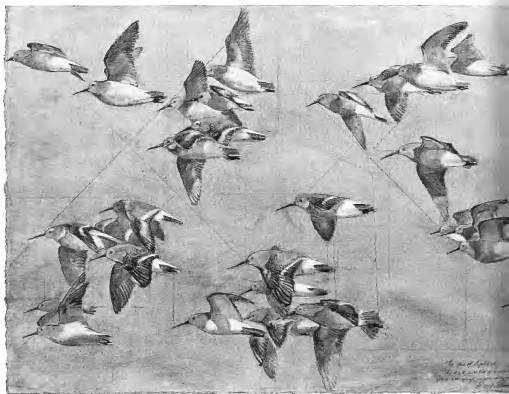
**AS THE MUSEUM'S OFFICIAL ARTIST-IN-RESIDENCE, PEGGY MACNAMARA OFTEN HAUNTS THE MUSEUM'S EXHIBITION HALLS, DRAWING AND PAINTING THE MANY OBJECTS ON DISPLAY.**

It is an exercise that has a long tradition in the history of art; from the time that museums first came into existence, artists have visited art collections and natural history collections to copy the masters and draw from nature. Drawing is a way of recording, and as such, has parallels with the first steps in the process of scientific inquiry: observation and measurement. It is a lesson that Peggy imparts to her students at the School of the Art Institute, many of whom can be seen intently observing and drawing the wide variety of objects exhibited at The Field.

Peggy began drawing and painting at the Museum 30 years ago. At the time, she was fascinated by the Museum's neoclassical interiors and traditional displays. She was especially intrigued by the Malvina Hoffman sculptures, a series of life-size bronze figures that were originally displayed in the Museum's *Hall of Man* (1931–1971), but are now located throughout the Museum. Eventually, Peggy became more interested in painting the “frozen wildlife” on display in the animal halls, especially the bird specimens.



CHRISTINA J. 216 / CATHERINE C. SCOTT



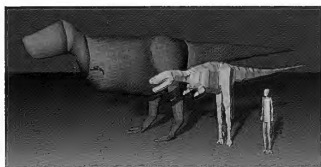
Peggy describes herself as a non-illustrator meaning she doesn't create scientific illustrations in the traditional sense. Instead, her approach is more immediate, more intuitive, and less belabored. Peggy has eighteen of her works on permanent display in the museum and has published other illustrations in books including *Painting Wildlife in Watercolor* (2003) published by Watson-Guptill. Her latest book, *The Art of Migration* will be released later this year by the University of Chicago Press. It is a look at the migratory birds and insects of the Mississippi Flyway. Several Museum zoologists are serving as consultants including John Bates (Bird Division), James Boone (Insect Division), and David Willard (Collections). IFF

Peggy Macnamara is guest curating the temporary exhibition, *Nature's Toolbox: Biodiversity, Art, and Invention*, opening on May 7.



# Same SUE, New Discoveries

By Nancy O'Shea, Public Relations Director



© JULIA MOLNAR

**A NEW STUDY—LED IN PART BY FIELD MUSEUM SCIENTIST, PETER MAKOVICKY—USED HIGHLY ACCURATE 3-D LASER SCANS OF FOSSIL SKELETONS TO REVEAL THAT TYRANNOSAURUS REX GREW MORE QUICKLY AND BECAME MUCH HEAVIER THAN PREVIOUSLY ESTIMATED.**

Earlier estimates of the weight of an adult *T. rex* were developed by building scale models or using equations related to body weights of other animals. The new study used accurate 3-D laser scans of *T. rex* fossil skeletons as a template for constructing digital models with flesh wrapped around the bones based on anatomical information from the living relatives of dinosaurs.

By comparing different *T. rex* specimens, including our famous SUE—the world's largest and most complete *T. rex*—an international research team concluded that the “king tyrant reptile” must have grown about twice as fast as previously estimated.

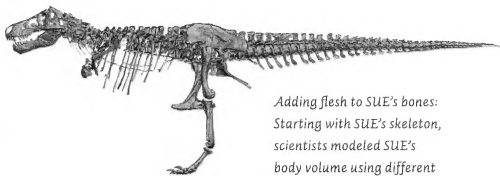
According to the study, SUE weighed over 9 tons when fully grown—30 percent heavier than scientists previously estimated. “We knew she was big, but the 30 percent increase in her weight was unexpected,” says Makovicky. The study also showed that *T. rex* grew as fast as 3,950 pounds per year during the teenage growth period.

The study also concluded that the locomotion of *T. rex* slowed as the animal grew. This is because its torso became longer and heavier while its limbs grew relatively shorter and lighter, shifting its center of balance forward.

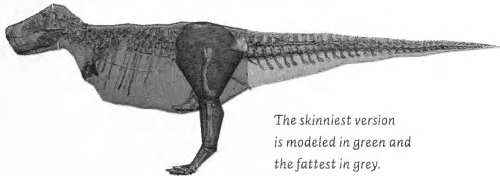
Thus *T. rex* wasn't the fastest of land animals. The study supports the relative consensus among scientists that big tyrannosaurs could run at peak speeds of about 10 to 25 miles per hour.

The study used a forensic laser scan of SUE performed by the Chicago Police Department, supplemented with CT scans provided by Loyola University Medical Center.

The study is titled “A computational analysis of limb and body dimensions in *Tyrannosaurus rex* with implications for locomotion, ontogeny, and growth.” It was published in the online journal *PLoS One* in October 2011. **TF**

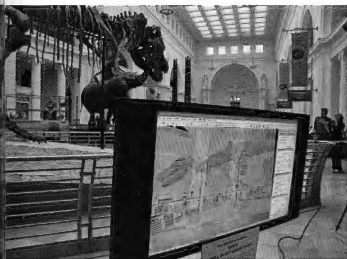
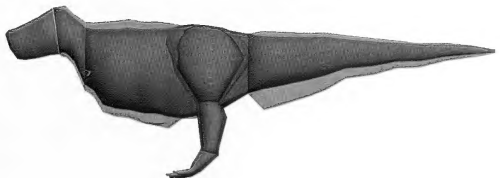


Adding flesh to SUE's bones: Starting with SUE's skeleton, scientists modeled SUE's body volume using different levels of “fleshiness.”



The skinniest version is modeled in green and the fattest in grey.

© JULIA MOLNAR



THE FIELD MUSEUM

# Scientists on Seven Continents

Compiled by Franck Mercurio, Associate Editor, In The Field

## THE FIELD MUSEUM IS AN INSTITUTION WITH GLOBAL REACH.

During any given year, more than 60 Museum scientists travel around the world to conduct research and fieldwork. Here is a sampling of seven curators who are making scientific discoveries on seven continents.



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### NORTH AMERICA JANET VOIGHT

*Associate Curator,  
Department of Zoology*

Along with my colleague, Leo Smith, I recently chartered a research vessel for 72 hours of trawling in the Pacific Ocean off San Diego, California. This area, called the Southern Californian Bight, contains diverse marine life that thrives in these nutrient-rich waters. Our crew of nine, including colleagues from Scripps Institute of Oceanography and The Ohio State University, worked onboard 24 hours a day, dragging our net through the water or across the bottom to a 5,000-foot depth. The specimens recovered—including benthic octopuses, mid-water cephalopods, and fishes—enhance our Invertebrate and Fishes collections.



GN91559\_00P

### SOUTH AMERICA

#### MATT VON KONRAT

*Adjunct Curator and Collections Manager,  
Department of Botany*

I am participating in a field program in the Cape Horn Archipelago region of southern Chile. The Field Museum collaborated with the New York Botanical Gardens and several Chilean institutions on this project. The 2011 expedition was the first in a four-year effort to document the diversity and distribution of an enigmatic group of plants called bryophytes—including mosses, liverworts, and hornworts—found throughout the southern tip of South America. Increased understanding of bryophytes will greatly add to the conservation of this critical biodiversity hotspot.



GN91558\_10D

### ANTARCTICA

#### PETER MAKOVICKY

*Associate Curator and Chair, Department of Geology*

Last winter, I led a fossil dig with Museum geologist Nathan Smith at the highest latitude and altitude dinosaur quarry on the planet: Mt. Kirkpatrick in the Central Transantarctic Mountains. During the Early Jurassic (200 to 175 million years ago), this area of the Antarctic was temperate and forested—and inhabited by dinosaurs. Over five weeks, the team extracted bones of the 25-foot carnivore *Cryolophosaurus*, and the herbivore *Glacialisaurus*. Bone-bearing rock was quarried into blocks weighing 200 to 700 pounds which were slung from a helicopter for transport back to camp. Two other dinosaurs, including one new to science, were also discovered.



CHRISTIE EBD

## AFRICA

### CHAP KUSIMBA

*Curator of African Anthropology,  
Department of Anthropology*

Guided by a philosophy that trade makes us human, I have spent the last 25 years studying how ancient transoceanic interactions between Africa, Asia, and Europe have shaped global history. The cultivated landscape—including the diverse foods we grow and eat everyday—provides testimony to the predominantly peaceful interactions between people over time. My recent archaeological research has been in Mtwapa, Kenya. Multiple grants are enabling my colleague Sloan Williams (U.I.C.) and me to do more fieldwork in Manda, Kenya, where we will explore the full impact and meaning of trade, migrations, and other ancient interactions in shaping the East African cultural mosaic.



CHRISTIE EBD

## ASIA

### OLIVIER RIEPPEL

*Rowe Family Curator of Evolutionary Biology,  
Department of Geology*

Since 1999, I have collaborated in fieldwork and research on Triassic marine reptiles that lived between 247 and 230 million years ago in southern China. I conducted excavations in Guizhou, Yunnan, and Anhui provinces. Fieldwork in China typically relies on recruiting local farmers and requires permission from state, county, and township officials. As a result of our efforts, a geological park has been constructed near Guanling; another is planned for Luoping. Most notable amongst the great variety of our discoveries is the ancestral turtle, *Odontochelys*, and the long-necked protorosaur, *Dinocephalosaurus*.



CHRISTIE EBD

## AUSTRALIA

### CORRIE MOREAU

*Assistant Curator, Division of Insects,  
Department of Zoology*

One of the places where I conduct fieldwork is Queensland, Australia. While there, I collaborate with local scientists and collect ants from all parts of the Australian Wet Tropics to determine how these diverse animals have responded to past climatic events, especially fluctuations in their rainforest habitat. Back at the Museum, I conduct DNA-based research to unlock the information stored within each ant's genome to tell the story of the past. I try to spend about one month a year in Australia and will be heading back for more fieldwork in June 2012. **TRF**



CHRISTIE EBD

## EUROPE

### WILLIAM A. PARKINSON

*Associate Curator of Eurasian  
Anthropology, Department  
of Anthropology*

I conduct archaeological field work aimed at understanding how Neolithic and Bronze Age villages evolved in southeastern Europe between 7000 and 1000 BC. I directed two archaeological projects in 2011 that investigated how these early agricultural villages grew into politically and economically complex chiefdoms and states. My research on the Great Hungarian Plain in the Carpathian Basin and on the Mani Peninsula of southern Greece involves researchers from the US, Greece, Hungary, and Canada, each of whom bring their own specialty to the projects. We are discovering that several factors—including trade and safety—encouraged early villagers to settle in specific spots.

# In the Spotlight: Su-Lin, America's First Panda

By Bruce Patterson, MacArthur Curator of Mammals, Department of Zoology

**INSIDE THE HALL OF MAMMALS, IN "CARNIVORE CORNER,"** a young giant panda sits in half recline. Like every specimen in the Museum's encyclopedic collections, it has fantastic stories to tell. This one hailed from Sichuan, the first live panda ever to be seen outside China; it arrived at Brookfield Zoo on February 8, 1937. Named Su-Lin ("A little bit of something precious"), the baby panda attracted huge crowds from around the world—her antics chronicled in countless articles, radio shows, and news reels.



COURTESY OF CHICAGO ZOOLOGICAL SOCIETY



COURTESY OF CHICAGO ZOOLOGICAL SOCIETY

*Su-Lin at the Brookfield Zoo, about 1937 or 1938 (above); and with uniformed zoo keeper (top of page).*



798575, ©2010 J. ARLEN BEAN.

When Su-Lin died of pneumonia 15 months later, her remains came to The Field Museum. In July 1938, Museum taxidermist C.J. Albrecht unveiled the mount that still greets visitors today. For months, the panda was on display in Stanley Field Hall, before moving to the *Mammals of the World* hall.

But the rest of Su-Lin came upstairs, incorporated into the scientific collections. Here, Chicago's celebrated zoo animal was found to be a male! Zoology curator D. Dwight Davis analyzed our 13 giant pandas in a 1964 monograph entitled *The Giant Panda: A Morphological Study of Evolutionary Mechanisms*. Systematic comparisons of pandas to related carnivores showed how adapting to a low-calorie diet of bamboo had transformed the panda's teeth and skull, paws, and even its reproductive and digestive systems. Davis correctly identified the panda as an aberrant bear, a contentious proposition confirmed by DNA evidence decades later. His remarkable inferences about evolutionary mechanisms from the study of Museum specimens inspired Stephen J. Gould, the Harvard evolutionist, to entitle one of his books *The Panda's Thumb*, a lasting tribute to Davis' discovery of the elongated wrist-bone that enables a panda to hold bamboo shoots while it chews.

Su-Lin and his kin continue to inspire and instruct Museum visitors and evolutionists alike. About 25 populations of giant pandas persist in China today, most with fewer than 20 individuals, totaling about 1,600 pandas (2004 census). Although pandas are sometimes poached, the greatest threat to their survival is continued loss and degradation of habitat. ¶¶¶

*Su-Lin today at The Field Museum.*

# Museum Youth Design Team: Teens Take The Field!

By Johanna Thompson, Digital Learning Specialist, Education Department

**WHAT HAPPENS WHEN TEENS INVADE THE MUSEUM FOR A SUMMER?  
CAN YOU IMAGINE GUMBY AS A RECENTLY EXCAVATED DINOSAUR FROM ANTARCTICA?  
OR WHAT MIGHT HAPPEN MUSICALLY IF LADY GAGA MARRIED A PALEONTOLOGIST?  
THEN YOU HAVE AN INKLING OF THE YOUTH DESIGN TEAM.**



Youth Design Team (or YDT) is the newest program offering from the Education Department for high school youth. These intensive summer teen internships and school-year course options are based on the teaching concept of a design studio. The program gives youth a design challenge and provides the content and tools necessary to solve the problem creatively. It allows teens to tinker, play, mock-up, imagine, and learn. It also lets them *teach* that same content in ways that are surprisingly innovative—and builds their self-confidence, critical thinking, and technical skills.

YDT is anything but traditional, so don't expect lectures, boring discussions, or assigned homework—unless it is the teens assigning themselves homework. Last summer, YDT participants built

computer games on environmental issues and ancient cultures; produced and recorded original music based on their interactions with Museum scientists and collections; recorded humorous and scientifically accurate podcasts; interviewed staff to tell the behind-the-scenes story of how the Museum works; created choose-your-own-adventure, live-action, and claymation movies; and wrote graphic novels. They even developed an online persona, **TakeTheField**. You can *like* them on Facebook and *follow* them on Twitter!

YDT summer participants also saw their work displayed in the public space of the Museum. You can view their work here: [fieldmuseum.org/schools/takethefield](http://fieldmuseum.org/schools/takethefield). Or head up to the 3-D Theater and watch teen-produced videos on the screen while you wait for the show to begin.

YDT academic courses take place one afternoon a week during the school year, offering course credit to qualifying 10th–12th graders from participating schools. Academic year 2012–2013 applications will be available in Spring 2012. **TF**



ALL PHOTOS: THE FIELD MUSEUM / EDUCATION DEPARTMENT

**Want to get in on the YDT 2012 Summer action?**

Apply NOW by going to [fieldmuseum.org/happening/youth-design-team](http://fieldmuseum.org/happening/youth-design-team) to download an application!

# Revealing Secrets

## Pioneering X-Ray Technology of the Past...

By Franck Mercurio, Associate Editor, In The Field

**FOR MORE THAN 85 YEARS, THE FIELD MUSEUM HAS USED IMAGING TECHNOLOGY, LIKE X-RAYS AND CT SCANS, TO LOOK INSIDE OBJECTS SUCH AS EGYPTIAN SARCOPHAGI AND MUMMY WRAPPINGS.**

In 1926 the Museum established its first Division of Reontgenology (or radiology) headed by Anna Reginald Bolan, an assistant professor at the University of Chicago. Stanley Field, then president of the institution, donated the first X-ray equipment to the Museum. This novel way of seeing inside artifacts was immediately popular with the public and scientists alike.

In 1931 Museum curator Berthold Laufer collaborated with British medical doctor, Roy L. Moodie, to publish some of the Museum's first X-ray images of human mummies in *Fieldiana*, the Museum's scientific journal. Included were images of Egyptian animal mummies such as the mummified cat pictured here. Many animal mummies are currently on display in the Museum's permanent exhibition, *Inside Ancient Egypt*.

Today, human and animal mummies in the Museum's collection are yielding even more secrets, thanks to modern CT (computed tomography) X-ray technology.

Traditional X-ray equipment creates two-dimensional images providing limited information when used on complex specimens such as mummies. Modern CT machines, however, create three-dimensional digital images that can be manipulated to show information in great detail and high resolution.

"What's great about CT is that it gives us the opportunity to look inside without having to be destructive, without having to be disrespectful, without having to unwrap the mummy or make any cuts or incisions," said JP Brown, leader of the Museum's latest mummy scanning project. Read JP's article on the next page to discover what new secrets modern CT scanning is revealing about the Museum's collections. **17F**



CSA74881

This cat mummy (right) was photographed and X-rayed at The Field Museum in 1931. Mummified cats, birds, and other animals were often given as temple offerings by the ancient Egyptians.



CSA74880

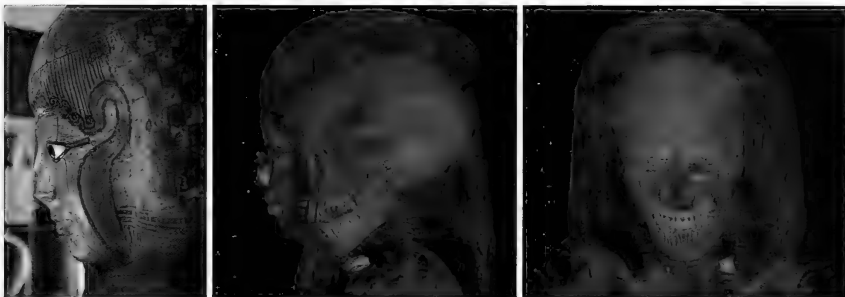


PHOTO: KAREN BEAN/CT SCANS - JP BROWN

## ...and Modern CT Technology of Today

By JP Brown, Collections Manager, Anthropology Department

**THIS PAST SUMMER, A MEDICAL CT SCANNER MOUNTED IN A SPECIALLY ADAPTED TRUCK WAS BROUGHT TO THE MUSEUM**, set up in the West Parking Lot, and used to generate scans of large specimens, including Egyptian and Peruvian mummies and Pacific Island effigy figures. Under normal circumstances, these objects would have been transported to a hospital for what scientists call “non-destructive examination in three dimensions with computed tomography” or CT scanning. This process works well for smaller, more robust objects.

But the cost and difficulty of transporting large, fragile objects can be prohibitive. So, instead of bringing the artifacts to the scanner, this time the scanner was brought to the artifacts.

*Above: CT scan of a Ptolemaic era mummy (circa 200 BC) revealing the skull of a woman about 40 years old.*

*Below: Museum interns and staff members move a Marquesan temple drum from storage to the portable CT scanner.*

In all, seven Egyptian mummies, three major Pacific Island pieces (including a seven-foot, 220-pound temple drum from the Marquesas Islands), and three Peruvian mummies were scanned. In addition, nine smaller, but nonetheless important, pieces from the Pacific Islands, the Middle East, and Asia were scanned. Most of the large

pieces required multiple scans to reveal all the details: a total of 61 CT examinations were performed over six working days creating a total of 21 GB of data.

The CT scans were analyzed and rendered on the Anthropology Department’s workstations in the Regenstein Laboratory. My research team—including interns Sophie Hammond Hagman and Hannah Koch, and volunteer Ellis Caspary—established reliable information about the individual mummy remains: age, sex, dental condition, diet, disease, and trauma. For example, CT scans indicate that one mummy was a 40-year-old female with an arthritic back.

Images of the CT scans are available for viewing on the Museum’s web site. Several will be on display in a new temporary exhibition, *Opening the Vaults: Mummies*, from February 17 to April 22. **11F**

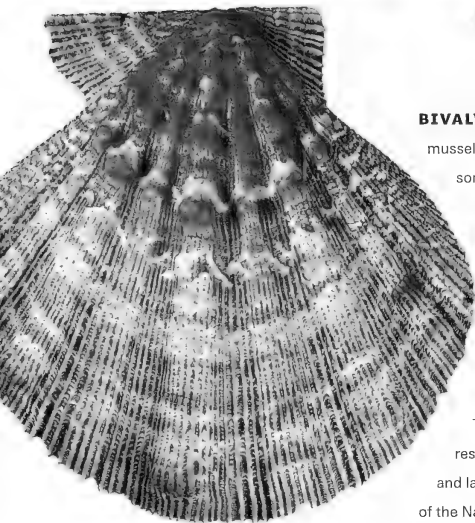
*The CT scanner was provided through the generosity of Robert Dakessian, President and CEO of Genesis Medical Imaging. The project was also made possible by several anonymous donors.*



JP BROWN

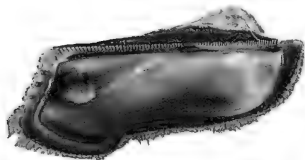
# Science on the Half Shell at The Field Museum

By Rüdiger Bieler, Curator of Zoology



Above: Lion's paw (*Nodipecten fragosus*)  
Below: Mossy Ark clam (*Arca imbricata*)

IMAGES © RÜDIGER BIELER, FIELD MUSEUM  
FM302048 (ABOVE) / FM1168532 (BELOW)



Tropical corals with  
a giant clam nestled among  
the colorful branches.

© Shutterstock.com / RHONDA EUFA



**BIVALVES INCLUDE MANY FAMILIAR MEMBERS** such as oysters, mussels, and clams. But they also include odd groups such as freshwater mussels—some of the most endangered group of invertebrates on this planet—shipworms, and galeommateoidea (clams that have moved the shells inside their bodies and glide around like slugs). Roughly 20,000 species of bivalves live today, but despite their enormous economic and ecologic importance, we still know little about their interrelationships and how they connect to the animal Tree of Life. How and when did they evolve? What were the key innovations along the way that allowed them to become so incredibly abundant and successful in the world's fresh and salt waters?

To address these questions, I have teamed up with colleagues from other research institutions including Harvard University, the Smithsonian Institution, and laboratories in the United Kingdom, Germany, and Australia, under the auspices of the National Science Foundation's "Assembling the Tree of Life" project. Together, we are collecting bivalve specimens from around the world, studying their anatomy and DNA, and analyzing this data to infer relationships and reconstruct a family tree of bivalves. At the same time, the project team is encountering and answering numerous research questions, training a new generation of specialists, and developing educational tools for students and teachers.

From the beginning, we wanted to make our work accessible to the general public. But how do we explain the steps that scientists take to understand the evolution of this group? With the help of the Paleontological Research Institution in Ithaca, New York, the project team developed a traveling exhibition to do just that: present museum visitors with a series of modules that explain our work and allow them to learn the key analytical steps. The exhibition, *Science on the Half Shell*, will feature an amazing diversity of bivalves, present video travelogues of our collecting sites, and include hands-on interactives so visitors can share in the excitement of scientific discovery themselves. **TRF**

*Science on the Half Shell is organized by the Paleontological Research Institution and made possible by a grant from the National Science Foundation.*

**SCIENCE ON THE HALF SHELL OPENS  
AT THE FIELD MUSEUM ON MARCH 23  
AND CLOSSES AUGUST 19, 2012.**



# Connect with The Field Museum on Facebook, Twitter, and Google+!

by Jane Hanna, Social Media Strategist, Museum Enterprises

Our online community enjoys exclusive daily content and fun features like Mammal Mondays and Insect of the Week. Discover astounding photos, watch behind-the-scenes videos, answer trivia questions, and voice your opinions. Ask questions, share your own photos and memories, and meet your fellow citizen scientists. We're your up-to-the-minute source for Museum news and information, and we want you to join the conversation!

Scan this code with your smartphone or visit:

**Facebook:** [www.facebook.com/fieldmuseum](http://www.facebook.com/fieldmuseum)

**Twitter** (@fieldmuseum): [twitter.com/fieldmuseum](http://twitter.com/fieldmuseum)

**Google+:** <http://bit.ly/rpD3bO>



## Corporate Relations Program

The Corporate Relations Program at The Field Museum offers member companies FREE employee general admission, discounted rates to limited-time special exhibitions, and a customized Corporate Family Day for every employee and their family. Member companies also receive a rental fee waiver for corporate meetings or events, invitations to private exhibition opening receptions, and much more. For further information, contact Julia Kittle, Corporate Relations Program Officer, at 312.665.7668 or email at [jkittle@fieldmuseum.org](mailto:jkittle@fieldmuseum.org).

## Field Museum Memberships

**Time to renew your membership?**

Call 312.665.7700 • Mon.–Fri., 8:30am–4:30pm

Visit [fieldmuseum.org/membership](http://fieldmuseum.org/membership)

*Field memberships also make great gifts!*

**museum**  
**campus** neighbors

### SHEDD AQUARIUM

No bones (or blood, or brains) about it, sea jellies might be 95 percent water, but they're 100 percent amazing. See diverse species at Shedd Aquarium's special exhibit, **Jellies**, through May 2012. During Shedd's Community Discount Days in January and February, Illinois residents can enjoy free general admission. For discount information, visit [www.sheddaqarium.org](http://www.sheddaqarium.org).

### ADLER PLANETARIUM

Take off on a **Deep Space Adventure** at the Adler Planetarium! A new immersive space experience inside **Deep Space Adventure** is the Grainger Sky Theater, which offers audiences the most technologically advanced theater experience ever developed. Encounter the Universe at a level of realism that can only be surpassed by actual space travel. Visit [adlerplanetarium.org](http://adlerplanetarium.org) for more information.

PHOTO: JIM GARDY / JORDAN WEINSTEIN



# program calendar

Program Tickets + Info 312.665.7400

General Museum Info 312.922.9410

## january

### Artists and Authors\* family program

**1.21, 11am–2pm** > Join local artist Malwina Bardonini in the *Crown Family PlayLab* to learn about winter animals and the homes that they live in, and then create your own bears' den.

## february

### Artists and Authors\* family program

**2.18, 11am–2pm** > Meet author Jen Cullerton Johnson as she reads from her award-winning book, *Seeds of Change*, and shares Wangari Maathai's story. An environmentalist, scientist, and women's rights activist, Wangari Maathai inspired her native Kenya to plant 30 million trees and became the first African woman to win the Nobel Peace Prize. Johnson will lead children in a seed planting activity echoing Wangari's message of *harabee*, which means "let's work together."

## march

### Artists and Authors\* family program

**3.17, 11am–2pm** > Come celebrate St. Patrick's Day in the *Crown Family PlayLab*! Hear your favorite tales from Ireland during our Story Time program and listen to traditional Irish music. Stop in the Art Studio to create a unique piece of artwork centered on the country and culture of Ireland.

### Leakey Lecture: Dr. Ofer Bar-Yosef\* adult program

**3.24, 1pm** > Join Dr. Bar-Yosef, world-renowned expert in paleolithic archaeology, as he discusses the dispersal routes and origins of modern humans. Learn about the current genetics and archaeological evidence that has been uncovered in Eurasia and Australia. Discover what this evidence tells us about past inter-breeding and colonization patterns in the entire vast terrestrial continent from the Atlantic to the Pacific coasts and the islands.

## april

### Banff Mountain Film Festival adult program

**4.11, 7pm** > Join us when the Banff Mountain Film Festival World Tour brings the spirit of outdoor adventure to Chicago. Traveling to exotic landscapes and remote cultures, while bringing audiences up-close and personal with adrenaline-packed action sports, the 2012 World Tour is an exhilarating and provocative exploration of the mountain world. These award-winning and audience favorite films that are chosen to travel the globe can be seen in Chicago at The Field Museum. \$10, \$8 for Museum members.

### Artists and Authors\* family program

**4.21, 11am–2pm** > Come get wrapped up with us in the *Crown Family PlayLab*! Hear a story about mummies and create your own wrapped treasure to take home with you.

\*FREE with Museum Admission  
in the Crown Family PlayLab

## DOZIN' WITH THE DINOS overnights at the museum



THE FIELD MUSEUM

SUE the T. Rex is having a sleepover! Join us for a night of family workshops, self-guided tours and hands-on activities. Explore ancient Egypt by flashlight, prowl an African savannah with man-eating lions, and take a stroll through the Royal Palace in Bamum, Africa.

Then spread your sleeping bag amidst some of our most popular exhibitions. The event includes an evening snack and breakfast in the morning.

Overnights begin Fridays at 5:45pm and end Saturdays at 9am and are only available for families and groups with children ages 6–12. Space is limited so reserve your sleeping spots now! For ticket options, see below. For information about the event, including a sample schedule and frequently asked questions, please visit our website, [fieldmuseum.org/overnights](http://fieldmuseum.org/overnights).

**Standard Overnight Tickets:** \$63, \$51 for Museum members and groups.

**Premium Package 1:** \$75, \$65 for Museum members. Premium Package 1 tickets allow guests to sleep upstairs in the *Evolving Planet* exhibit—with the dinosaurs!

**Premium Package 2:** \$87, \$77 for Museum members. Premium Package 2 guests sleep upstairs in the *Evolving Planet* exhibit and go on a behind-the-scenes tour with a Field Museum scientist.

**January 20\* • February 3\*, 10\*, & 17 • March 9 & 16  
April 20 • May 4 • June 15**

\*sold out!



### Sign up for the Crown Family PlayLab E-News!

This e-newsletter is an early science literacy resource geared towards families with young children ages two through six. To start receiving emails, please contact [playlab@fieldmuseum.org](mailto:playlab@fieldmuseum.org).

[fieldmuseum.org](http://fieldmuseum.org)  
event details are available online!

# attn: teens!

## Digital Planet

**Summer 2012 >** Are you ready to uncover the real story of science? In this week-long digital video camp, you'll explore the current research of The Field Museum's fearless scientists! Equipped with digital media, you'll interpret science for the silver screen like never before! Registration begins in winter 2012. For more information please visit [bit.ly/DP2012](http://bit.ly/DP2012) or email [jthompson@fieldmuseum.org](mailto:jthompson@fieldmuseum.org).



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## Youth Design Team Summer Internship

**Summer 2012 >** Part digital design studio, part summer Museum internship, and part behind-the-scenes Museum Studies program, this program is designed for high school students who want to get museum experience and develop mobile media for youth visitors to the Museum. Teens with digital skills are encouraged to apply; however, these skills are not required for participation. To learn more, see page 13, visit [bit.ly/YDT2012](http://bit.ly/YDT2012) or email [jthompson@fieldmuseum.org](mailto:jthompson@fieldmuseum.org).



# summer programs register now!

## Summer World's Tour > ages 5–10

Summer World's Tour offers a week of adventures in Chicago's premier museums for children ages 5 to 10 years old. Campers will explore exciting new worlds at the Adler Planetarium, discover some of nature's most extreme mammals at The Field Museum, and become explorers of the aquatic realm at the Shedd Aquarium. Activities include investigating exhibits, creating original art projects, playing learning games and having lunch along the shore of Lake Michigan.

### Register for one of the following four week-long sessions:

1: July 9–13    2: July 16–20    3: July 23–27    4: July 30–August 3

Registration is held through the Adler Planetarium and will occur in late January.

## Dino Camp > ages 3–4

I spy a dinosaur, do you? Join us for two days of dino discovery where we will learn how to spot a dinosaur, see SUE's skull, and dig for dinosaur bones! This is an early childhood camp, designed expressly for young explorers ages 3–4 with their caregivers.

Program takes place from 9am–Noon in the Crown Family PlayLab.

### Choose from the following two-day sessions:

- |                            |                             |
|----------------------------|-----------------------------|
| 1: Mondays, June 4 & 11    | 5: Mondays, June 18 & 25    |
| 2: Tuesdays, June 5 & 12   | 6: Tuesdays, June 19 & 26   |
| 3: Wednesdays, June 6 & 13 | 7: Wednesdays, June 20 & 27 |
| 4: Thursdays, June 7 & 14  | 8: Thursdays, June 21 & 28  |

\$75 general, \$65 for Museum members (one adult included in the price per camper). Registration begins February 1, 2012 online at [fieldmuseum.org](http://fieldmuseum.org) or by phone, 312.665.7400.



## Don't miss these exhibitions before they close!



## Whales: Giants of the Deep

**Through January 16, 2012**

Immerse yourself in the vibrant underwater world of whales and discover the many ways in which these magnificent creatures continue to intrigue, astound, and inspire us.

*Developed and presented by the Museum of New Zealand Te Papa Tongarewa. This exhibition was made possible through the support of the New Zealand Government.*

*Prod. Major Sponsor: Wells Fargo.*

## Travelogues and Technologies—from Small Sketches to the Biggest Book

**Extended through April 15, 2012**

Discover how technological advancements have changed how we document explorations of the world as you follow Field Museum expeditions from the 1890s to present day. Uncover extraordinary stories of travel, scientific discovery, and rare encounters.

*Travelogues and Technologies— from Small Sketches to the Biggest Book is organized by The Field Museum.*

## Natural Wonders:

### A Roman Mosaic from Lod, Israel

**Through April 22, 2012**

With its depictions of exotic animals, fantastical fishes, and ancient Mediterranean ships, the Lod Mosaic is one of the world's best preserved and most unique Roman mosaics. Study the mosaic's intricate detail and uncover the stories hidden in its imagery.

*Lod Mosaic is organized by the Israel Antiquities Authority.*

## Getting to The Field Museum

Many buses and rail lines provide access to The Field Museum. For more information, call 888.YOURCTA or visit [www.transitchicago.com](http://www.transitchicago.com). Visit [www.rtachicago.com](http://www.rtachicago.com) for regional transit information.

## What do you think about In The Field?

For questions about the magazine, call 312.665.7107, email [ewaldren@fieldmuseum.org](mailto:ewaldren@fieldmuseum.org) or write Emily Waldren, Editor. For general membership inquiries, including address changes, call 866.312.2781.

always be discovering.

The Field  
Museum

## Members' Nights

You are invited to the most exclusive and engaging event at The Field Museum: Members' Nights! At Members' Nights explore our vast collections, interact with our curators and staff, and witness behind-the-scenes work that defines The Field Museum as a cultural and scientific institution. Members' Nights are scheduled for Thursday, April 12 and Friday, April 13. The event will be Museum-wide and held from 5–10pm.

Reservations are required for this event. Please contact Membership Services at 312.665.7705 M–F 8:30am–4:30pm or make your reservation online at [fieldmuseum.org/support/reserve-membership-tickets](http://fieldmuseum.org/support/reserve-membership-tickets).



## Shop for Treasures from Eurasia

Visit the Genghis Khan Store to continue your exploration of treasures from the vast Mongolian Empire.

Learn more about this fascinating and complex realm as you discover riches from the central Asian steppes to the Sea of Japan, and from Mongolia itself south into the Indian subcontinent.

We've shopped far and wide to bring you stunning pieces like this contemporary necklace featuring a hand-carved pendant from Afghanistan created by local Chicago jeweler, Kass Sigel. As always, you'll find gifts and toys to excite your little ones, an array of books for the whole family, and much more.

Shop the Museum Stores 24 hours a day at [fieldmuseum.org](http://fieldmuseum.org).

Remember that all proceeds from the Stores directly support the Museum's public and scientific programs, and that all Field Museum members receive 10 percent off their purchases in the Museum Stores.

